8.5 (continued)

Parallel and Perpendicular Lines

$y = mx + b$

Goal: Find the slope of lines parallel or perpendicular to a given linear function.

What would be an example of two lines that are parallel?

$y = mx + b$

$y = \frac{1}{2}x + 4$ $y = \frac{2}{1}x + 3$

$y = \frac{1}{2}x + 3$ $y = \frac{1}{2}x + 3$

What would have to be true about their equations to make them parallel?

have to have Same slope but diff. y-int

Give the slope of a line parallel to the given line:

1) $y = 4x + 2$ $m_{||} = 4$

2) $3x - y = 8 + y$ $y = 3x - 8$ $m_{||} = 3$
   $-8 + x$ -8

3) $4x + 3y = 12$
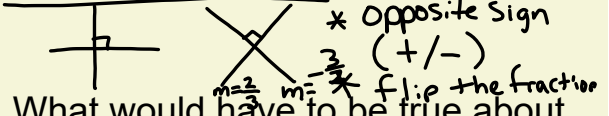 $-4x$ $-4x$

   $\frac{3y}{3} = \frac{-4x}{3} + \frac{12}{3}$

F↔D

$-1 \, \lrcorner \, 1 \, \lrcorner \, 3$ $y = \frac{-4}{3}x + 4$ $m = -4/3$

A %↔%

What would be an example of two perpendicular lines?

* opposite sign
$(+/-)$
$m = \frac{2}{3}$ $m = \frac{-3}{2}$ flip the fraction

What would have to be true about the equations to make them perpendicular to each other?

Give the slope of a line perpendicular to the given line:

1) $\frac{2y}{2} = \frac{1x}{2} + \frac{5}{2} \Rightarrow y = \frac{1}{2}x + \frac{5}{2}$ $m_\perp = \frac{-2}{1} = -2$

2) $\frac{-7x - 5}{1} = y$ $m_\perp = \frac{1}{7}$

3) $x + 4y = 12 + x$
   $+x$

   $\frac{4y}{4} = \frac{1x}{4} + \frac{12}{4}$ $m_\perp = -4$

   $y = \frac{1}{4}x + 3$

Find the slope of a line that has given relationship to the line with equation

$4x + 3y = -18$

Parallel to the line

$m_{||} = -\frac{4}{3}$

Perpendicular to the line

$m_\perp = \frac{3}{4}$

$4x + 3y = -18$
$-4x$ $-4x$

$\frac{3y}{3} = \frac{-4x}{3} - \frac{18}{3}$

$y = -\frac{4}{3}x - 6$

For the line with the given equation, find the slope of a parallel line and the slope of a perpendicular line.

y = -3x

Paral: m = -3
perp: m = 1/3

y = 4x + 10

Parallel: m = 4

perp: m = -1/4

2x - 5y = 15

Paral: 2/5
perp: -5/2

$-5y = -2x + 15$
$\frac{-5y}{-5} = \frac{-2x}{-5} + \frac{15}{-5}$ $y = \frac{2}{5}x - 3$

8.5 Homework

Pg. 433-435

#2, 6-8 all, 13, 24, 26, 30, 31, 34 - 40 evens